

# HANDS-FREE VOICE PROCESSOR



## Product Selector Guide



Microsemi's hands-free voice processing solutions integrate industry-leading enhanced features, including wideband and narrow-band ADC/DACs, on-chip memory, and application-specific firmware, to improve voice quality, minimize background noise, and reduce system complexity and cost. The selector guide outlines the hardware and firmware features for security systems, home automation, IP phone system, hands-free car kit, video conference and intercom applications.

Microsemi's voice processing technology integrates industry-leading features and dedicated firmware to deliver high-quality hands-free voice performance while reducing system design complexity.

Hands-free communications equipment must support high-quality voice in severe noise conditions. For example, speakerphone designers must compensate for vibration created by plastic enclosures, echo, and double-talk.

As illustrated in the application block diagrams, Microsemi's voice processing solution simplifies design and delivers voice quality improvements in hands-free communication systems.

In complex noise environments, such as car kits and conference rooms, Microsemi's voice processing solution cancels echo, maintains a constant background noise and converges during double-talk situations.

The chip delivers excellent performance in double-talk situations. While most solutions deliver only half-duplex operation, Microsemi's proprietary algorithm is able to continuously converge and track changes in the echo path to support full-duplex operation during double-talk situations.

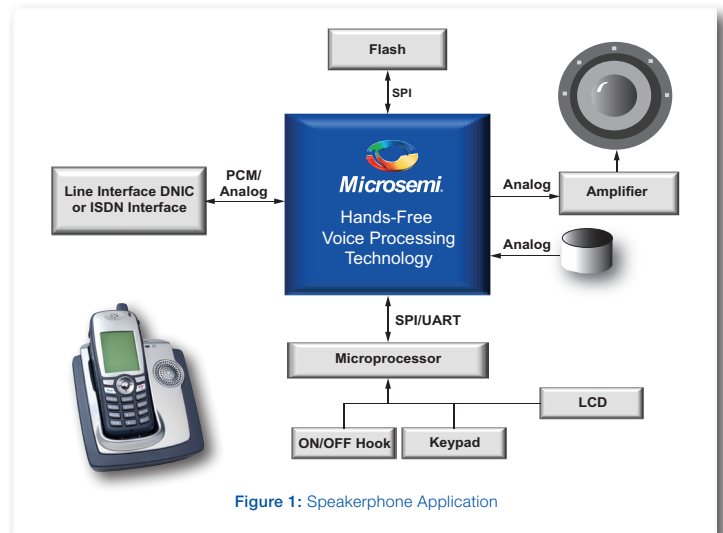


Figure 1: Speakerphone Application

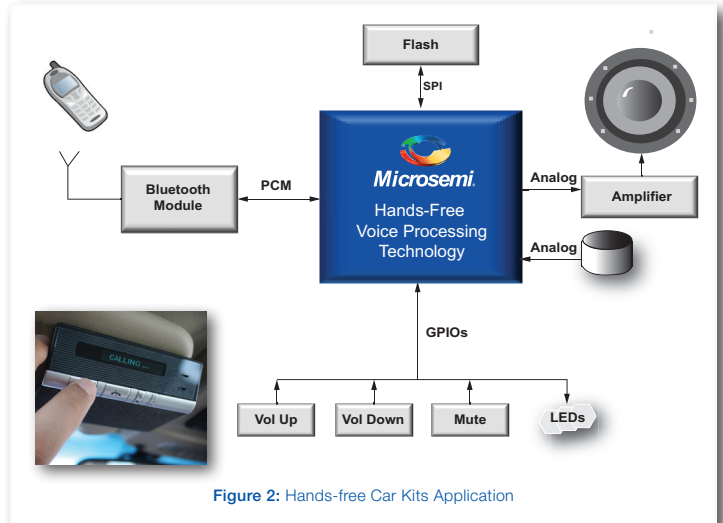


Figure 2: Hands-free Car Kits Application

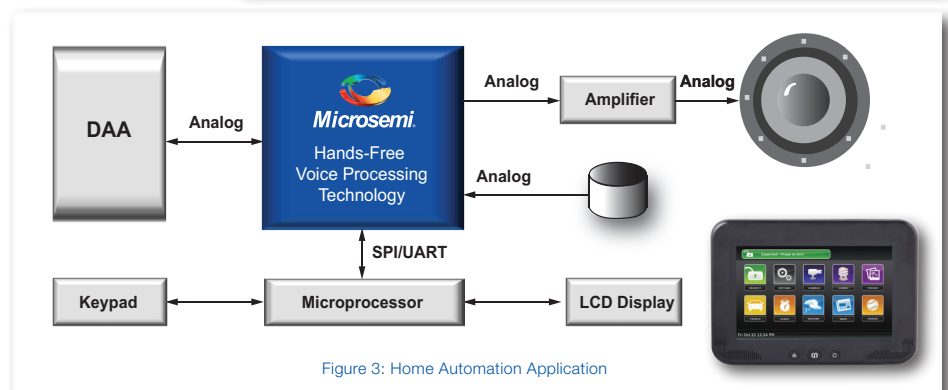


Figure 3: Home Automation Application



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Hardware	ZL38012	ZL38005	ZL38004
Dual ADC/DAC	•	•	•
Narrowband processing	•	•	•
Wideband processing			•
Audio band DAC			•
Internal programmable microphone amplifier	•	•	•
Microphone buffer		•	•
Dual PCM port (TDM, I2S)		•	•
Single PCM port (TDM, I2S)	•		
GPIOs	5	11	11
Control ports (SPI, UART)	•	•	•
Field upgradeable	•	•	•
Firmware	ZLS38507	ZLS38501	ZLS38502
AEC/LEC	•	•	•
Non-linear AEC	•	•	•
Maximum echo tail	256ms	256ms	128ms/256ms
Psycho acoustic noise reduction	•	•	•
EQ	16 band	16 band	16/22 bands
Tone generator		•	•
A-law/Mu-law/Linear PCM	•	•	•
User gain control	•	•	•
NLP with comfort noise injection	•	•	•
Anti howling	•	•	•
AGC	•	•	•
G.169 ALC	•	•	•
Mute	•	•	•
Controller less mode	•	•	•
Side tone injection	•	•	•
Dynamic range compression	•	•	•
Secondary channel bypass		•	•
Stereo bypass			•
Broadcast mode		•	•
Mixing mode		•	•
Monitoring mode		•	•
Half-duplex mode	•	•	•
Optional Answering Machine Firmware (ZLS38503)			
Voice prompting/messaging		•	•
DTMF Receiver		•	•
Tone Generator		•	•
Call program tone detection		•	•
Easy file management		•	•
Applications			
Hands-free car kits	•		
Video conferencing			•
Intercom and security systems	•	•	
Home automation	•	•	
IP phones (narrowband)		•	
IP phones (wideband)			•
Wideband residential phone			•



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Learn more at [www.microsemi.com](http://www.microsemi.com).